



Lake County, Florida
Office of Procurement Services

ADDENDUM #3

Invitation to Bid 06-055

Bid Title: Lake County Detention Center Roof Replacement

Date: 4/26/06

This addendum is being issued to make the following clarifications to the bidding documents. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. Receipt of this addendum shall be acknowledged by the bidder by initialing and dating the appropriate line. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

Question: Why are there 2 different coping details?

Answer: Delete detail B1 on sheet A3.02 and Add the following note to detail B3 on sheet A3.01.

“Continuous Pressure-treated Wood Blocking Anchored to Top of Wall Construction with 3/8” x 8” Long Anchor Bolts @ 2’-8” O.C. Max. – Comply with FMG 1-28 Requirements”.

Question: Are we to assume the nailers under the copings are properly attached or do we figure to replace with new at the required fastening pattern?

Answer: No destructive demolition was performed to determine the integrity of the blocking under the existing coping. The project should anticipate providing new blocking as indicated.

See two attachments for the specifications for the 3-ply SBS modified bitumen roofing systems for the project as requested. The changes are essentially a doubling of the membrane interplay, and it is confirmed with all three roofing manufacturers. However, given the ongoing confusion with the roofing specifications, we are re-issuing the two specifications.

SECTION 07552 - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Three-ply hot asphalt applied SBS-modified bituminous membrane roofing system with smooth surface base plies and mineral surfaced cap sheet.
 - 2. Tapered roof insulation.
 - 3. Pressure-treated wood blocking.
 - 4. Membrane wall flashing.

- B. This Section includes the installation of acoustical roof deck rib insulation strips furnished under Division 5 Section "Steel Deck."
- C. Related Sections include the following:
 - 1. Division 1 Section "Alternates" for alternate roofing system.
 - 2. Division 3 Section "Lightweight Insulating Concrete Alternate" for system described in Alternate.
 - 3. Division 7 Section "SBS-Modified Bituminous Membrane Roofing Alternate" for system described in Alternate.
 - 4. Division 7 Section "Sheet Metal Flashing and Trim" for copings, metal roof penetration flashings, flashings and counterflashings.
 - 5. Division 7 Section "Roof Expansion Assemblies."

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg F, measured at the mop cart or mechanical spreader immediately before application.
- C. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns.
- C. Product Approval: Proof of product approval of roof assembly from Florida Building Commission.
- D. Samples for Verification: For the following products:
 - 1. 12-by-12-inch square of smooth-surfaced roofing membrane sheet flashing backer sheet.
 - 2. 12-by-12-inch square of mineral-granule-surfaced roofing membrane cap sheet flashing sheet, of color specified.
 - 3. 12-by-12-inch square of roof insulation.

4. Full-size walkway tread in each color and texture required.
 5. Six insulation fasteners of each type, length, and finish.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized or licensed by manufacturer to install roofing system.
 - F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of meeting performance requirements.
 - G. Manufacturer's written installation instructions for specified system.
 - H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency for components of roofing system.
 - I. Maintenance Data: For roofing system to include in maintenance manuals.
 - J. Roof System Warranty: Sample copy of roofing manufacturer's warranty for entire roof system including insulation and roofing as specified.
 - K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
 1. Contractor shall maintain a full-time Supervisor/Foreman who has at least 3 years experience installing the specified system and who shall not be changed without the approval of Owner.
- B. Manufacturer Qualifications: A qualified manufacturer that has roofing system identical to that used for this Project.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.
- E. Roof Membrane Wind Load Design: Calculations for wind load design shall be signed and sealed by a Professional Engineer licensed in the State of Florida verifying membrane system is in compliance with ASCE 7-98. Particular attention is called to the nailing pattern of vented base sheet ensuring resistance to 110 mph winds plus importance factor.
- F. Product Approval: Roof assembly shall meet Florida Building Commission product approval.
- G. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 1. Exterior Fire-Test Exposure: Class A
- H. Pre-installation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system including, but not limited to, the following:
 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

2. Review requirements for Contractor's access to the project site, site security and working conditions.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Review procedures and timing for removal of existing roof and insulation system.
6. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
7. Review structural loading limitations of roof deck during and after roofing.
8. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs and condition of other construction that will affect roofing system.
9. Review governing regulations and requirements for insurance and certificates if applicable.
10. Review temporary protection requirements for roofing system during and after installation.
11. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.9 WARRANTY

- A. Entire roof system assembly from tapered insulation through roofing cap sheet, metal flashing, counter flashing, expansion joints, edging, coping and trim shall be warranted under one warranty by roofing manufacturer.
- B. Manufacturer's Warranty: The Manufacturer shall provide a 20 year, written, non-penal sum, non-prorated, no dollar limit warranty against material defects and installation workmanship including flashing and accessories.
 1. Warranty shall cover the cost of removal and replacement, and shall clearly state the warranty period and warranty serial number.
 2. Warranty shall cover all materials (insulation, roof membrane, flashings, copings, curbs, seams, sheet metal, vents, sealants, light weight insulating concrete system and other roof components) and workmanship to maintain the entire system in a watertight and weather-tight condition.
 3. Effective date of Warranty shall be date of Substantial Completion, or date of acceptance by the County, whichever is later.
 4. Warranty shall cover wind design conditions of 110 mph winds plus importance factor per ASCE 7-98.
 5. Wind launched debris or projectiles are not part of this warranty.
- C. Installer's 24-Month Maintenance Warranty: The Contractor shall provide a 24-month bonded guaranty beginning on the effective date of Warranty and running concurrent.

1. Roofs shall be inspected semiannually during the 2-year Maintenance Warranty period and a Condition Report issued to the appropriate County Maintenance staff.
2. Contractor shall warrant that it will be on site within 24 hours to make necessary permanent or temporary repairs. Warranty shall state that should the Contractor fail to make such repairs within the time period, County will have the right to have the repairs made and charge the cost to the Contractor; such repairs by County shall not void the system warranty.
3. Emergency repairs required reasonably and immediately to protect life or property shall not void Warranty.
4. Contractor roof access request shall not be unreasonably denied.
5. Delay of construction contract payment by the Contractor or Roofing Contractor shall not be cause to withhold warranty performance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. SBS-Modified Bituminous Membrane Roofing:
 - a. Johns Manville International, Inc.
 - b. Siplast, Inc.
 - c. Soprema Roofing and Waterproofing Inc.

2.2 SBS-MODIFIED ASPHALT-SHEET MATERIALS

- A. Roofing Membrane Sheets: ASTM D 6163, Grade S, Type I or II, glass-fiber-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.
- B. Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I or II, glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:
1. Granule Color: White.

2.3 SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM

- A. Roof system may either be torch-down or hot-mop systems. A hot-mopped system is specified herein.
- B.

	MEMBRANE INTERPLIES (2 LAYERS)	WHITE GRANULAR CAP SHEET
Johns Manville (System 3FID)	DynaBase	DynaGlas
Siplast (System similar to JM)	Paradine 20	Paradine 30FR
Soprema (System similar to JM)	Elastophene Flam	Elastophene GR <i>plus</i> FR

2.4 FLASHING SYSTEM

FLASHING BACKER SHEET	FLASHING SHEET
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Johns Manville	DynaWeld Base ASTM 6163 Torchable SBS	DynaWeld Cap ASTM 6163 Torchable SBS
Siplast	Paradine 20TG	Veral Al
Soprema	Sopralene Flam 180	Sopralene 180 GR 3.5

2.5 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
- B. Asphalt Primer: ASTM D 41.
- C. Roofing Asphalt: ASTM D 312, Type III.
- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- E. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- G. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."
- H. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer; include pressure-treated wood blocking as required.

2.6 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 aluminum foil facer on both major surfaces.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope match that of existing tapered insulation, unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Cold Fluid-Applied Adhesive: Manufacturer's standard cold fluid-applied adhesive formulated to adhere roof insulation to substrate.
- C. Insulation Cant Strips: ASTM C 728, perlite insulation board.
- D. Tapered Edge Strips: ASTM C 728, perlite insulation board.

- E. Cover Board: ASTM C 728, perlite insulation board, 1/2 inch thick, with top surface seal-coated.

2.8 WALKWAYS

- A. Walkway Pads: Polymer-modified, reconstituted solid-rubber, surface-textured, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/4 inch thick, minimum.
 - 1. Pad Size: 30-inches x 60-inches

PART 3 - EXECUTION

3.1 REMOVAL OF EXISTING ROOF

- A. Consult with local governing authority regarding removal and disposal of potentially hazardous materials.
- B. Remove only as much existing roof membrane as can be completely covered with the new roofing system within the same work day.
- C. Should removal of existing roof reveal damage to existing substrate, notify County for further direction immediately.
- D. Replace any existing wood blocking to accommodate new roof system.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that surfaces and site conditions are ready to receive work.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that concrete substrate is clean and visibly dry and free of moisture.
 - 4. Verify that roof openings, curbs, pipes sleeves, ducts and vents through roof are solidly set.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with installation means installer accepts existing substrate.

3.3 PREPARATION

- A. Protect building surfaces against damage from roofing work.
- B. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- D. Prime surface of concrete deck with asphalt primer at a rate of 1 gal./100 sq. ft. and allow primer to dry.

3.4 INSULATION INSTALLATION

- A. Comply with roofing system manufacturer's written instructions for installing roof insulation.
- B. Apply no more insulation than can be sealed with roofing membrane in the same day.

- C. Install tapered insulation under area of roofing to conform to slopes indicated. Imbed first layer of insulation into mopping of hot bitumen in accordance with insulation manufacturer's written instruction. Install each additional layer of ¼-inch tapered insulation system in mopping of hot asphalt with joints staggered from preceding layer.
- D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation. Install insulation boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around through penetrations.
- E. Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.
- F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer.
 - 1. Fasten according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 2. Fasten to resist uplift pressure at corners, perimeter, and field of roof.
 - 3. Apply hot roofing asphalt to underside and immediately bond cover board to substrate.

3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Asphalt Heating: Heat and apply SEBS-modified roofing asphalt according to roofing system manufacturer's written instructions.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond eaves, installing as follows:
- B. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
- C. Apply full 36 inch wide smooth-surfaced SBS base sheet set in hot asphalt over insulation. SBS base sheets shall be applied full width overlapping the preceding by 3 inches so that at least one ply covers the insulation in all locations. Install each SBS ply so that it shall be firmly and uniformly set into hot asphalt without voids.

- D. Apply one full width SBS granule-surfaced cap sheet over base sheet maintaining 4 inch side and end laps over preceding sheets. Set sheet firmly and uniformly in hot asphalt without voids.
- E. Equiviscous temperature at point of application shall be no more than 25 degrees from the bitumen rating indicated on bitumen container label. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 400 deg F.
- F. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps in cap sheet while bead is hot to maintain a neat appearance.

3.7 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer Sheet Application: Adhere backer sheet (if required) to walls or parapets and over roofing membrane at cants in system recommended by roofing manufacturer.
 - 3. Flashing Sheet Application: Adhere flashing sheet to substrate as system recommended by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.
- C. Secure top of base flashing securely at terminations and perimeter of roofing as recommended by roofing manufacturer.
- D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.
- E. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
 - 1. Install stripping according to roofing system manufacturer's written instructions.

3.8 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Test Cuts: Test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
 - 1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.

2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
- C. Final Roof Inspection: Arrange for roofing system and insulation system manufacturers' technical personnel to inspect roofing installation on completion and submit report to Owner.
 1. Notify Owner 48 hours in advance of date and time of inspection.
 - D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
 - E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 3.10 PROTECTING AND CLEANING
- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
 - B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of completion and according to warranty requirements.
 - C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction. Remove bituminous markings from finished surfaces.

END OF SECTION 07552

SECTION 07552 ALTERNATE - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING OVER LWIC

PART 4 - GENERAL

4.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

4.2 SUMMARY

- A. This Section includes the following:
 1. SBS-modified bituminous membrane roofing system, torch-down application over cellular lightweight insulating concrete deck.
 2. Membrane wall flashing.
 3. Temporary 2-Ply BU Roof
- B. Related Sections include the following:
 1. Division 1 Section "Alternates" for alternate roofing system.
 2. Division 3 Section "Lightweight Insulating Concrete"
 3. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings and counterflashings.

4. Division 7 Section "Roof Expansion Assemblies."

4.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus **25 deg F**, measured at the mop cart or mechanical spreader immediately before application.
- C. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.

4.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

4.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Crickets, saddles, and tapered edge strips, including slopes.
 - 3. Roof vent locations (if required).
- C. Product Approval: Proof of product approval of roof assembly from Florida Building Commission.
- D. Samples for Verification: For the following products:
 - 1. **12-by-12-inch** square of base sheet flashing backer sheet.
 - 2. **12-by-12-inch** square of mineral-granule-surfaced roofing membrane cap sheet flashing sheet, of color specified.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized or licensed by manufacturer to install roofing system.
- F. Manufacturer's certification label/Factory Mutual compliance, installation instructions, literature and data and Certificate of Analysis from a testing laboratory for all roof system materials, fastenings, flashings and roof vents that are specified and required.
- G. Manufacturer's written installation instructions for specified system.
- H. Maintenance Data: For roofing system to include in maintenance manuals.
- I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.
- J. Roof System Warranty: Sample copy of roofing manufacturer's warranty for entire roof system including Cellular Lightweight Insulating Concrete and roofing as specified.

4.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** The Roofing Contractor shall be a Florida Certified Roofing Contractor, with at least 5 years of documented successful experience with the specified system. Roofing Contractor shall be a qualified firm that is approved, authorized or licensed by roofing system manufacturer to install manufacturer's product and who is eligible to receive the manufacturer's specified warranty
 - 1. Contractor shall maintain a full-time Supervisor/Foreman who has at least 3 years experience installing the specified system and who shall not be changed without the approval of Owner and Architect.
- B. **Manufacturer Qualifications:** A qualified manufacturer that has roofing system identical to that specified for this Project.
- C. **Testing Agency Qualifications:** An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. **Source Limitations:** Obtain components for roofing system from only one specified roofing system manufacturer.
- E. **Roof Membrane Wind Load Design:** Calculations for wind load design shall be signed and sealed by a Professional Engineer licensed in the State of Florida verifying membrane system is in compliance with ASCE 7-98. Particular attention is called to the nailing pattern of vented base sheet ensuring resistance to 110 mph winds plus importance factor.
- F. **Product Approval:** Roof assembly shall meet Florida Building Commission product approval.
- G. **Fire-Test-Response Characteristics for all One-Storey Applications:** Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: UL Class A.
- H. **Fire-Test-Response Characteristics for Two-Storey Application:** Where lightweight insulating concrete is part of a fire-resistance-rated roof-deck assembly, provide lightweight insulating concrete identical to that used in assemblies tested for fire resistance per ASTM E 119 by a testing agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: Indicated on drawings by design designations from UL's "Fire Resistance Directory."
- I. **Pre-installation Conference:** Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review requirements for Contractor's access to the project site, site security and working conditions.
 - 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 5. Review procedures and timing for removal of existing roof and insulation system.
 - 6. Review structural loading limitations of roof deck during and after roofing.
 - 7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 8. Review governing regulations and requirements for insurance and certificates if applicable.
 - 9. Review temporary protection requirements for roofing system during and after installation.
 - 10. Review roof observation and repair procedures after roofing installation.

4.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

4.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

4.9 WARRANTY

- A. Entire roof system including temporary roofing, Cellular Lightweight Insulating Concrete system through roofing cap sheet, flashing, expansion joints, metal edging and trim shall be warranted by roofing manufacturer.
- B. Manufacturer's Warranty: The Manufacturer shall provide a 20 year, written, non-penal sum, non-prorated, no dollar limit warranty against material defects and installation workmanship including flashing and accessories.
 - 1. Warranty shall cover the cost of removal and replacement, and shall clearly state the warranty period and warranty serial number.
 - 2. Warranty shall cover all materials (roof membrane, flashings, copings, curbs, seams, sheet metal, vents, sealants, light weight concrete system and other roof components) and workmanship to maintain the entire system in a watertight and weather-tight condition.
 - 3. Effective date of Warranty shall be date of Substantial Completion, or date of acceptance by the Architect and Lake County together, whichever is later.
 - 4. Warranty shall cover wind design conditions of 110 mph winds plus importance factor per ASCE 7-98.
 - 5. Wind launched debris or projectiles are not part of this warranty.
- C. Installer's 24-Month Maintenance Warranty: The Contractor shall provide a 24-month bonded guaranty beginning on the effective date of Warranty and running concurrent.
 - 1. Roofs shall be inspected semiannually during the 2-year Maintenance Warranty period and a Condition Report issued to the appropriate Lake County representative.
 - 2. Contractor shall warrant that it will be on site within 24 hours to make necessary permanent or temporary repairs. Warranty shall state that should the Contractor fail to make such repairs within the time period, Lake County shall have the right to have the repairs made and charge the cost to the Contractor; such repairs by Lake County shall not void the system warranty.
 - 3. Emergency repairs required reasonably and immediately to protect life or property shall not void Warranty.
 - 4. Contractor roof access request shall not be unreasonably denied.
 - 5. Delay of construction contract payment by the Contractor or Roofing Contractor shall not be cause to withhold warranty performance.

PART 5 - PRODUCTS

5.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Johns Manville International, Inc.
 - 2. Siplast, Inc.
 - 3. Soprema Roofing and Waterproofing Inc.

5.2 TEMPORARY ROOF

- A. Asphalt-coated, fiber glass ply sheet for use in BUR roofing systems and conforming to ASTM D 2178, type IV.

5.3 SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING SYSTEM

- A. Roof system may either be torch-down or hot-mop systems. A torch-applied system is specified herein.

B.

	VENTED BASE SHEET ASTM 4897	MEMBRANE INTERPLIES (Two layers)	WHITE GRANULAR CAP SHEET
Johns Manville (4FID)	JM Ventsulation Felt ASTM 4897	DynaWeld Base ASTM 6163 Torchable SBS	DynaWeld Cap ASTM 6163 Torchable SBS
Siplast	Paravent FS	Paradine 20TG	Paradine 30FRTG
Soprema	GAF Stratavent or JM Ventsulation	Elastophene Flam	Elastophene Flam GR

5.4 FLASHING SYSTEM

	FLASHING BACKER SHEET	FLASHING SHEET
Johns Manville	DynaWeld Base ASTM 6163 Torchable SBS	DynaWeld Cap ASTM 6163 Torchable SBS
Siplast	Paradine 20TG	Veral AI
Soprema	Sopralene Flam 180	Sopralene 180 GR 3.5

5.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
- B. Concrete Primer: ASTM D 41, Asphalt Primer.
- C. Roofing Asphalt: ASTM D 312, Type III IV III or IV as recommended by roofing system manufacturer for application.
- D. Roofing Asphalt: ASTM D 6152, SEBS modified.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- F. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- H. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim "
- I. One-Way Vents: Provide one-way vents as recommended by roofing manufacturer for specified roof system to provide proper venting of lightweight insulating concrete deck substrate and ensure roof warranty.
- J. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

PART 6 - EXECUTION

6.1 REMOVAL OF EXISTING ROOF

- A. Consult with local governing authority regarding removal and disposal of potentially hazardous materials.
- B. Remove only as much existing roof membrane as can be completely covered with the temporary roofing system within the same work day.
- C. Should removal of existing roof reveal damage to existing substrate, notify County for further direction immediately.
- D. Replace any existing wood blocking to accommodate new roof system.

6.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - a. Test for moisture on a daily basis in a method both standard to the roofing industry and acceptable to roof manufacturer.
 - 5. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of **1/16 inch** out of plane relative to adjoining deck.
 - 6. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with work signifies substrate is acceptable to the roof installer and roofing manufacturer for the purpose intended.

6.3 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Install acoustical roof deck rib insulation strips, specified in Division 5 Section "Steel Deck," according to acoustical roof deck manufacturer's written instructions.

6.4 TEMPORARY ROOF MEMBRANE APPLICATION

- A. Prime existing concrete deck with appropriate concrete asphalt primer.
- B. Starting at low edge of roof, apply two plies of Type IV glass, hot-mopped individually in overlapped fashion to existing concrete deck.
- C. Temporary roof shall be installed to receive a lightweight insulating concrete pour and care shall be taken to ensure the building is watertight during the entire re-roofing operation.

6.5 LIGHTWEIGHT CONCRETE APPLICATION

- A. See Division 3 "Lightweight Insulating Concrete Alternate".

6.6 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing." 4-ply torch applied system includes:
 - 1. Vented base sheet mechanically fastened to cellular lightweight insulating concrete deck.
 - 2. Two SBS modified bitumen asphalt inner plies.
 - 3. Mineral-granule-surfaced cap sheet.
 - 4. Flashing backer sheet.
 - 5. Flashing cap sheet.
 - 6. Torch-down application.
 - B. Only start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
 - C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
 - D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- 6.7 BASE-SHEET INSTALLATION
- A. Install lapped base sheet course, extending sheet over and terminating beyond cants. Mechanically fasten base sheet to substrate.
 - 1. Lap in accordance with manufacturer's recommendations.
- 6.8 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION
- A. Install modified bituminous roofing membrane inner ply and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - 1. Torch apply to substrate.
 - 2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
 - B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps while bead is hot.
 - C. Install roofing membrane sheets so side and end laps shed water.
- 6.9 FLASHING AND STRIPPING INSTALLATION
- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer Sheet Application: Mechanically fasten backer sheet to walls or parapets. Adhere backer sheet over roofing membrane at cants in method recommended by roofing manufacturer's written instructions.
 - 3. Flashing Sheet Application: Adhere flashing sheet to flashing backer sheet in method recommended by roofing manufacturer's written instructions.

- B. Extend base flashing up walls or parapets a minimum of **8 inches** and a maximum of 24 inches above roofing membrane and **4 inches** onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
- D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.
- E. Roof Drains: Set **30-by-30-inch** metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of **4 inches** beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
 - 1. Install stripping according to roofing system manufacturer's written instructions.
- F. Install one-way vents as recommended by roofing manufacturer for specified roof system to provide proper venting of lightweight insulating concrete deck substrate and ensure total roof warranty.

6.10 FIELD QUALITY CONTROL

- A. Testing Agency: A qualified independent testing and inspecting agency will be engaged by the Owner to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

6.11 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07552-Alternate

If you have any questions concerning this Addendum or the Invitation to Bid, please contact Donna Thielhart, Contracting Officer 352.343.9525, dthielhart@co.lake.fl.us, as soon as possible before the closing date.

Firm or Individual's Name: _____

Date: _____

Signature: _____ Title: _____

Typed/Printed Name: _____